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i Breakout Session 2A

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i How to characterize and reconcile the tradeoffs implicit in making risk management decisions?

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Twelve people attended the session concerning tradeoffs in making risk management decisions. A basic question that was addressed at the beginning by the moderator was -- What is a trade-off? The classical definition is two-fold:

A balancing of factors all of which are not attainable at the same time; or
Giving up one thing in return for another.

It was noted that the following issues make the explicit process of making risk management decisions somewhat difficult:

1. How do we identify all relevant factors that may be relevant to a decision?
2. How do we characterize all relevant factors that may be vying for attention?
3. How do we compare those factors?

It was noted that a number of factors clouded these questions. First is the timeframe of the decision. One may make very different decisions about managing the risk of a hazard in a 100-year timeframe as opposed to a 4-year frame,

Second is geographic scale. Global change may be managed at a regional level whereas floods may require management at a household level.

Third is the distribution of costs and benefits. Releases of hazardous materials caused by flooding may have disproportional impacts on low income or minority households.

Fourth is the choice of alternatives to consider in risk management. Until recently many mitigation options for reducing losses were not politically feasible.

Finally uncertainties make quantifying the tradeoffs difficult. For example historical rainfall records may not be represented by a single probability distribution.

Four major themes capture most of the discussions in this breakout session:

1. Status of Risk Assessment Models
2. Role of Formal Methods/Models

3. How to conduct a National Assessment
4. When to conduct a National Assessment

1. Status of Risk Assessment Models

A central concern of the discussion group is the ability of risk assessment models to support decision making about investing in hazard reduction. It was noted that the nature of formal models differed greatly among hazards. Some models are primarily stochastic while others are deterministic. This makes comparisons very challenging and perhaps misleading. In addition, uncertainties will vary markedly between models, further confounding the comparison issue.

A second concern was model validation. There is no standard method to validate a model. How does one validate the results of a model? A variety of methods are used in science for validation of results. It was suggested that standardization is needed in order to compare model results.

A third concern raised was that the scientific community does not even know what models exist and at what stage of development they are at. Furthermore the appropriate uses of alternative models is not really clear.

Recommendation: The SNDR establish a subcommittee to identify and assess the potential uses of risk assessment models for hazard management. The effort should attempt to examine the data inputs needed to use the model and the information that is outputted by the model. It would also be desirable if the usefulness to risk management would be assessed. A second stage of the process would be to develop validation guidelines

2. Role of Formal Methods/Models

A second point concerned whether formal models are needed for risk management. Considerable discussion ensued that centered on HAZUS. Some felt that formal models are necessary for good risk management. Others suggested that process is more important and risk management decisions must be negotiated, as models cannot fully incorporate values and other non-comensurables.

A related theme was the usefulness of formal models to state and local government. At present we have a very poor understanding of how any model is used in risk management decision making. Moreover the costs of obtaining data to use models (such as HAZAUS) may restrict the use of the models. It was also noted that institutional barriers limited the use of models. Some politicians simply refuse to believe the results of models when they are non-intuitive or challenge a political position.

Finally the ability of models to capture non-quantifiable dimensions of risk tradeoffs was discussed. It is likely that formal methods will never satisfy critics over the difficult issues of valuing human life or making explicit changes in the quality of human life.

Recommendation: Develop a mechanism for disseminating information on local experiences with hazard risk management experiences.

3. How to conduct a National Assessment.

A major issue on risk management decision making concerned scale and approach. On one hand it was concluded that was relevant to conduct a national risk assessment of natural hazards. It was suggested that the National Climate Change Impact Assessment might provide a useful model. On the other hand it was noted that what was meaningful for the nation may not be relevant for the neighborhood or the community. This argues for a different approach to risk management that begins with assessments at the local level.

Recommendation

Work at both scales - conduct a national assessment awhile conducting a carefully chosen set of localized assessments.

4. When to conduct a National Assessment.

The final issues concerned when to conduct an assessment. Some argued that the current state of modeling precluded timely assessment. The argument that it was premature to assess risks due to both model and data limitations. It may be a decade before adequate tools and data make an assessment worth conducting

A second and less vocal position was to conduct an assessment now. This would be valuable in identifying limitations and setting priorities for data collection or model development.

Recommendation: Conduct a relative risk assessment on a hazard by hazard basis to prioritize risk management policies.